



Real Time Water Quality Monthly Report Leary's Brook December 2005

General

- Data from the Leary's Brook monitoring station is monitored by the Water Resources Management Division staff on a monthly basis.

Maintenance and Calibration of Instrumentation

- The following table displays the dates when the Datasonde was removed for routine cleaning, maintenance and calibration and when it was redeployed during the month of December.

Table 1: Table of Datasonde removal and installation dates

Date Installed	Date Removed
	December 9, 2005
December 10, 2005	December 19, 2005
December 20, 2005	

- Water quality readings were taken with a Minisonde at the time of removal for comparison purposes. The Minisonde was calibrated prior to use.

Data Interpretation

- Areas in the graphs where the data lines go abruptly down to the x axis and show no data occur when the datasonde is removed for routine cleaning, maintenance and calibration. The dates where this occurs correspond to Table 1 above.
- In general, water quality parameters were stable during the month of December with expected daily/nightly (diurnal) and seasonal changes occurring.
- Stage height** (water level) rose and fell in response to daily precipitation as seen in **Figure 1**. Increases in stage height correspond to precipitation events as seen in Table 2.
- Water temperature** fluctuated in response to daily maximum and minimum air temperature. This is demonstrated by comparing the graph in **Figure 2** to the air temperature data in **Table 2**. Warmer water temperatures correspond to warmer air temperatures experienced from December 12th to December 15th and at the end of the month

Table 2: Weather information for St. John's, NL provided by Environment Canada for December 2005

<u>D</u> <u>a</u> <u>y</u>	<u>Max</u> <u>Temp</u> °C	<u>Min</u> <u>Temp</u> °C	<u>Mean</u> <u>Temp</u> °C	<u>Heat Deg</u> <u>Days</u> C	<u>Cool Deg</u> <u>Days</u> C	<u>Total</u> <u>Rain</u> mm	<u>Total</u> <u>Snow</u> cm	<u>Total</u> <u>Precip</u> mm	<u>Snow on</u> <u>Grnd</u> cm
<u>01</u>	11.2	1.0	6.1	11.9	0.0	0.0	0.0	0.0	0
<u>02</u>	7.4	0.9	4.2	13.8	0.0	14.6	0.0	14.6	0
<u>03</u>	11.9	2.3	7.1	10.9	0.0	2.4	0.0	2.4	0
<u>04</u>	4.3	-0.1	2.1	15.9	0.0	0.2	0.8	1.0	0
<u>05</u>	4.7	-2.4	1.2	16.8	0.0	12.4	2.4	13.4	0
<u>06</u>	0.7	-2.8	-1.1	19.1	0.0	0.0	7.0	6.2	2
<u>07</u>	-1.7	-3.9	-2.8	20.8	0.0	0.0	4.2	3.6	12
<u>08</u>	-2.0	-7.4	-4.7	22.7	0.0	T	T	T	12
<u>09</u>	-1.6	-7.8	-4.7	22.7	0.0	0.0	T	T	12
<u>10</u>	4.7	-2.0	1.4	16.6	0.0	8.4	13.8	21.6	11
<u>11</u>	2.3	-3.2	-0.5	18.5	0.0	0.0	T	T	10
<u>12</u>	8.5	1.9	5.2	12.8	0.0	18.4	0.0	18.4	9
<u>13</u>	7.1	0.4	3.8	14.2	0.0	3.4	0.0	3.4	1
<u>14</u>	9.5	2.3	5.9	12.1	0.0	10.8	0.0	10.8	T
<u>15</u>	9.5	-0.5	4.5	13.5	0.0	2.0	T	2.0	T
<u>16</u>	1.8	-1.0	0.4	17.6	0.0	0.0	T	T	T
<u>17</u>	7.1	-1.6	2.8	15.2	0.0	5.2	T	5.2	0
<u>18</u>	2.4	-2.6	-0.1	18.1	0.0	0.0	T	T	0
<u>19</u>	0.6	-2.9	-1.2	19.2	0.0	0.0	2.4	2.4	0
<u>20</u>	2.0	-4.9	-1.5	19.5	0.0	0.0	T	T	2
<u>21</u>	-0.4	-11.0	-5.7	23.7	0.0	0.0	3.8	3.4	T
<u>22</u>	-3.6	-14.8	-9.2	27.2	0.0	0.0	0.2	0.2	3
<u>23</u>	1.3	-9.2	-4.0	22.0	0.0	0.0	0.8	0.8	3
<u>24</u>	0.1	-6.0	-3.0	21.0	0.0	0.0	3.0	0.8	2
<u>25</u>	-1.0	-8.3	-4.7	22.7	0.0	0.0	T	T	4
<u>26</u>	0.8	-2.7	-1.0	19.0	0.0	10.2	13.2	22.0	4
<u>27</u>	5.5	0.7	3.1	14.9	0.0	16.8	0.0	16.8	6
<u>28</u>	1.4	0.0	0.7	17.3	0.0	2.8	T	2.8	T
<u>29</u>	3.0	-0.7	1.2	16.8	0.0	0.0	0.0	0.0	T
<u>30</u>	9.9	2.7	6.3	11.7	0.0	0.4	0.0	0.4	T
<u>31T</u>	9.2	-1.1	4.1	13.9	0.0	6.8	T	6.8	0
Sum				542.1	0.0	114.8	51.6	159.0	

Figure 1

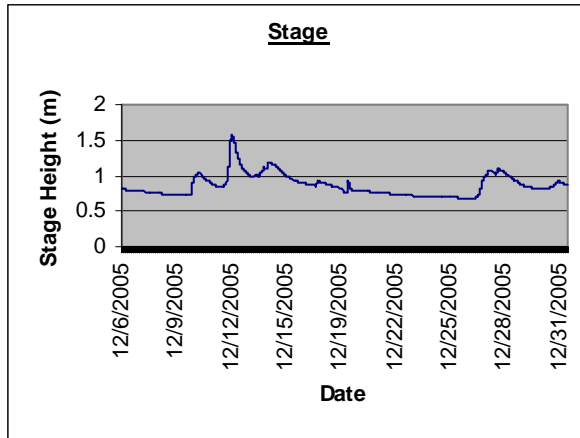
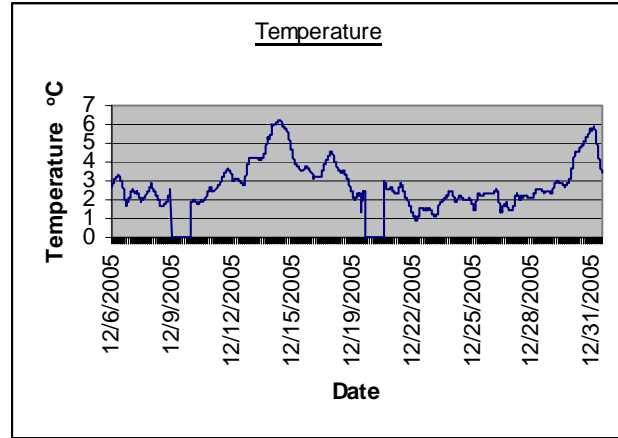


Figure 2



- **Conductivity** levels fluctuated throughout the month with several notable spikes as observed in Figure 3. These spikes usually occurred in response to precipitation events.
- **Total dissolved solids (Figure 4)** levels reflected the changes in conductivity. Conductivity measurements are a good indication of total dissolved solids and total dissolved ion concentrations, although this is not an exact linear relationship.

Figure 3

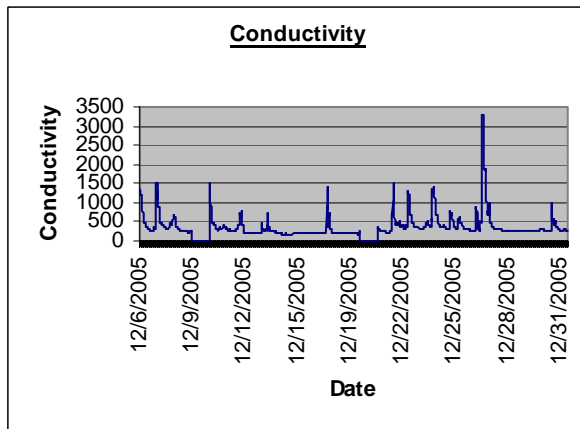
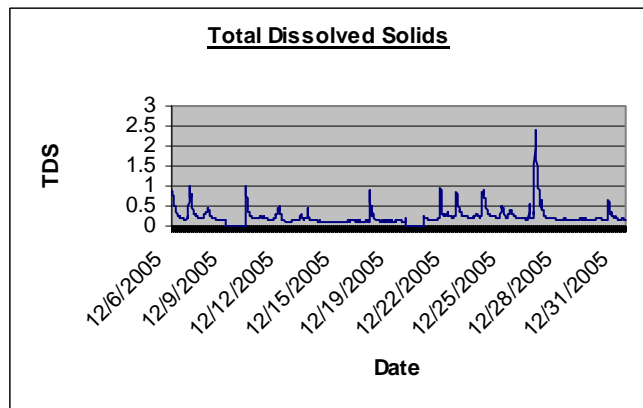


Figure 4



- The **pH** levels for the month of December ranged from 5.83 to 8.20. There were some instances where the pH was outside the CCME recommended Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9 (see **Figure 5**). The average pH level for December was 6.96. (see **Table 3**).
- **Dissolved oxygen** levels ranged between 9.30 mg/L to 14.00 mg/L during the period of measurement (see **Figure 6**). During the month of December, dissolved oxygen measurements went above the CCME recommended maximum guideline of 9.5 mg/L. The average DO level for the period of measure was 13.44 mg/L (see **Table 3**).

Figure 5

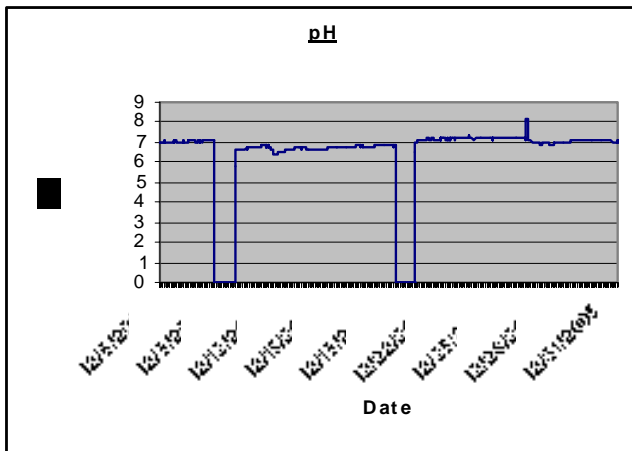
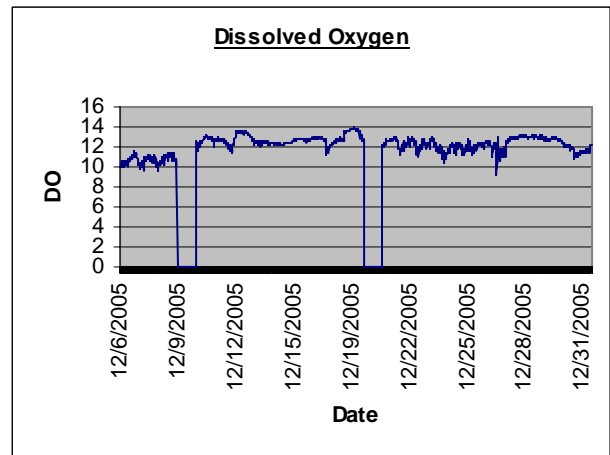
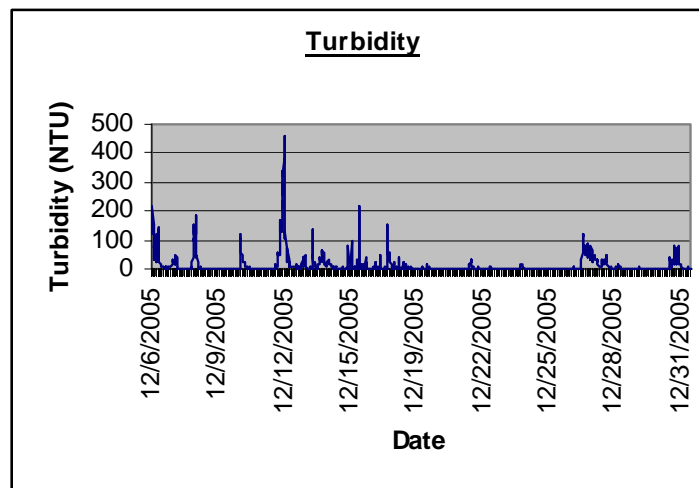


Figure 6



- Turbidity** levels fluctuated and had several minor spikes noted throughout the month. The turbidity spikes (see **Figure 7**) are normally in response to precipitation. A large notable turbidity spike occurred on December 12th. Significant precipitation was noted on this date so the large turbidity spike can be attributed to this precipitation and subsequent runoff. Many turbidity spikes exceeded the CCME recommended maximum of 8 NTU above background levels.

Figure 7



Additional Information

- Table 3 provides summary statistics on water quality parameters for Leary’s Brook during the month of December 2005.

Table 3: Summary statistics for December 2005.

	Water Temperature °C	pH	Conductivity	Dissolved Solids	Percent Saturated	Dissolved Oxygen	Turbidity
Max	6.26	8.20	3276.70	2.39	102.40	14.00	457.00
Min	0.87	5.83	154.30	0.10	66.80	9.30	0.00
Average	2.90	6.96	374.37	0.24	91.15	12.29	12.54
Standard Deviation	1.18	0.22	314.42	0.20	6.81	0.83	33.37

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